GEOGRAPHICAL RECORD

AMERICAN GEOGRAPHICAL SOCIETY

An Expedition to the Sierra de Perijá, Venezuela. Under the auspices of the American Geographical Society an exploration of the Sierra de Perijá is being carried out by Mr. Theodoor de Booy of the University of Pennsylvania Museum.

Mr. de Booy left New York in May for Maracaibo. By the middle of the month he had reached La Morqueta, a camp of the Caribbean Petroleum Company in about latitude 10° 15′ N. at the foot of the Sierra. The Sierra de Perijá is the northern portion of that fork of the eastern Andes that dies down in the plains of Guajira. It constitutes the watershed between the César valley and the streams draining to the Gulf of Maracaibo and forms the northern part of the boundary between Colombia and Venezuela. A great part of the Sierra is absolutely unknown. In 1859 the great cartographer of Venezuela, the Italian Codazzi, set out to map this region, but before his work here was begun he died in the little Colombian town of Espiritu Santo; his work was never continued. According to Sievers the densely wooded eastern (Venezuelan) slopes are "still totally unknown" ("Venezuela und die deutschen Interessen," *Angewandte Geogr.*, 1st Series, Part 3, Halle, 1903, p. 10). The Sierra, however, is notorious as the home of a fierce and savage Indian tribe—the Motilones. During the days of Spanish rule missions were established among them. No trace of such remains today, and beyond mutual recriminations there is no contact between settlers and Motilones. On the Colombian side they have caused the abandonment of coffee plantations, while the still existing settlements live in a state of terror. On the Venezuelan side companies prospecting for petroleum west of the Gulf of Maracaibo have found their operations seriously impeded by these savages.

At La Morqueta Mr. de Booy could learn nothing of the Sierra; even the names of peaks were unknown. However, at Machiques, some eight hours' ride to the south (in 9° 50′ N. and Long. 72° 25′ W.; thus on Mapa del Estado de Zulia, 1:550,000, by F. Chacín Navas, 1915, one of the best maps of the region) he found Indians (Tucucus) to accompany him in a penetration of the Motilones' country. Two days' ride from Machiques a tribe of these Indians named Macoitas (Macoas) were encountered. Mr. de Booy's comments on this feared and hated tribe are interesting: "I fail to see where these Macoitas live up to their savage reputation: they certainly treat me splendidly and regard my presence as a huge joke. They have built me a house, about 14 feet by 24 feet, and seem delighted to bring me all kinds of food." Mr. de Booy reports the collection of splendid ethnographical material, including photographs.

The need for a survey of the Sierra is confirmed. Mr. de Booy states that Sievers' map (Karten sur physikalischen Geographie von Venezuela, *Petermanns Mitt.*, Vol. 42, 1896) is quite erroneous in regard to the eastern slopes of the Sierra; the width of the mountain zone in the latitude (10° 10′) of the town of Rosario, or Perijá, shown on the Sievers map appears to be much too great. Among the geographical results reported in two of Mr. de Booy's letters, dated June 11 and 21, is the discovery of a series of falls on the headwaters of the Macoita River, a tributary of the Apón, which discharges into the Gulf of Maracaibo. On the right fork of the river are three falls, the uppermost and lowest of which are triple; their heights are about 350 feet, 40 feet, 180 feet. On the left fork is an upper double fall with a height of over 160 feet and a lower fall of 60 feet. At the junction of the forks is another triple fall 170 feet high. The uppermost fall on the right fork descends from an elevation of about 4,000 feet, the adjoining mountain summits having a height of 4,600 feet; the elevation at the junction of the two forks is 2,750 feet. These falls have never before been seen by a white man.

Publication of an Index to the Bulletin of the American Geographical Society, 1852-1915. The Society has just published an "Index to the Bulletin of the American Geographical Society, 1852-1915," by Arthur A. Brooks. The index is a book of the same format as the *Bulletin* of the Society, the predecessor of the *Geographical Review*, and contains xi + 242 pages. It covers the whole series of the Society's periodical publication from its inception in 1852 to the beginning of the present series in 1916, irrespective

of the changes of title it underwent in that period—*Proceedings* and *Journal* being the other names it bore.

An introductory "Historical and Bibliographical Note" calls attention to the great value of the series. During the sixty-four years spanned by its existence "it was the repository of much of the work of importance done in exploration and research in this country; indeed, it is no exaggeration to say that the pages of its fifty-odd volumes contain more geographical material than all other American publications of the time outside of government documents." The fact that no key to this material had been published made it highly desirable to provide one. A table is added showing for each volume the title, volume number and corresponding year, composition, and number of pages. Without such a synopsis it is almost impossible to cope with the bibliographical intricacies of the series, with its frequent change in the form of publication in its early years—a difficulty which is reflected by the fact that the printed catalogue cards of the Library of Congress include a statement quoted from a letter from the Librarian of the Society to explain one feature of its complexity.

The index comprises all articles and papers, entered under both author and topic, together with the record of geographical news and specific entries for all maps and illustrations. Book reviews and titles have not been indexed, and as a rule articles have not been analyzed.

The index is being sent free to all the organizations with which the Society maintains exchange relations. Others can procure copies for $2.00 each, postpaid.

NORTH AMERICA

The Forest Resources of Texas. Two recent publications by the State Forester of Texas and his associates bring together in compact form the available information regarding the forest resources of the state. Of the broader scope is "General Survey of Texas Woodlands, Including a Study of the Commercial Possibilities of Mesquite," by J. H. Foster, H. B. Krausz, and A. H. Leidigh (*Agric. and Mechan. College of Texas Dept. of Forestry Bull. 3,* 1917). The major part of this survey is devoted to descriptions of the various natural forest regions—the East Texas timber belt, the Edwards Plateau in the central part of the state, the Rio Grande Plain chaparral, and the Rocky Mountain types of the western part of the state. Naturally the East Texas timber belt, which comprises by far the most important body of timber in the state, claims most attention. It will be referred to again below.

Next in importance comes the Edwards Plateau. This region, which within the memory of men still living was primarily grass covered, has been invaded to a remarkable extent by trees and other woody growth as a result of the reduction in the number of grass fires which has accompanied the development of agriculture and grazing. Except in the sheltered and well-watered canyon bottoms there is not sufficient moisture to support dense forests, and the tree growth in general resembles that of a semi-arid region. This is particularly true of the prairie sections, where mesquite is rapidly taking possession of wide areas. In the hills several well-recognized types are found, such as the shinneries (dense, dwarf thickets of shin oak, with live oak and other species in mixture), mountain oak thickets, post oak areas, and cedar brakes. The latter, which are composed of pure stands of mountain cedar, are by far the most valuable. No estimates are available as to either the stand or the output of this species, but the report states that few regions in the United States produce more cedar than the Edwards Plateau and the country to the north of it. Cedar areas are commonly believed to be increasing as a result of cutting, since with adequate fire protection cedar tends not only to maintain itself but to take possession of land cleared of oak and other species.

The three remaining wooded regions are dismissed rather briefly. Live oak occurs both in compact bodies and as scattered trees throughout the central portion of the state from the Rio Grande to Oklahoma. Since this species is essentially an occupant of the coastal plain in other Southern States, its wide distribution in central Texas and its absence from the eastern part of the state are considered quite remarkable. The tree frequently reaches large size but is chiefly of value as a source of fuel and other material for home use. The Rio Grande Plain contains some seventy to eighty species of small trees and shrubs, commonly known as chaparral, none of which occur in the Atlantic type of forest and fully one-fourth of which belong to the bean family. The most interesting feature of this chaparral growth is its remarkable encroachment on the arid plains to the north. In the Trans-Pecos region in the extreme western part of the state, Rocky Mountain species are found at altitudes of over 6,000 feet. Piñon pine is the chief species of the foothills and slopes, and western yellow pine, Douglas fir, and limber pine of the summits and high canyons. Comparatively little information is available as to the abundance and uses of the various trees in this region.

The second publication, "Forest Resources of Eastern Texas," by J. H. Foster, H. B. Krausz, and G. W. Johnson (*Bull. 5* of the same series, 1917), amplifies the information given in the "General Survey of Texas Woodlands" regarding this section of the state. While the latter bulletin contains rather general descriptions of the natural regions into which the belt may be divided—loblolly pine, longleaf pine, shortleaf pine, bottomland, swamp and bayou, and post oak—the former contains more detailed data regarding the forest conditions and forest industries by counties.

It may surprise some to learn that East Texas, in spite of its tremendous output of forest products, is rated by the authors as essentially an agricultural region. Even now, of the forty counties discussed in *Bulletin 5*, approximately 30 per cent is improved agricultural land. Virgin timber amounts to only 14 per cent and second growth to 8 per cent. Culled and cut-over lands exceed 37 per cent, and the remainder of the area consists of pasture, waste, and overflowed lands. Cutting is proceeding rapidly, and it is stated that "there is every reason to hope and expect that large bodies of cut-over lands will be divided into farms and the best of them improved." As a result of this process it is anticipated that in the not distant future large timber tracts will be comparatively rare and that most of the woodland areas of the region will be attached to farms.

S. T. D. DANA

A Remarkable Hailstorm in Nebraska. A hailstorm of unusual severity occurred in southeastern Nebraska on August 8, 1917. The length and width of the area covered, the large amount of damage done to crops and property, the size of the hailstones and the enormous quantities of hail that fell, were all remarkable. Mr. George A. Loveland of the U. S. Weather Bureau at Lincoln, Nebr., made a study of this storm immediately after its occurrence (*Monthly Weather Rev.*, Vol. 45, 1917, pp. 540-542). The length of the storm track was approximately 92 miles; the width varied from 4 to 12 miles. Unfortunately no actual measurements of the sizes of the hailstones were made. The statement "as large as baseballs" was a common one. Drifts of hail three to five feet high were found in protected places. In an orchard near Exeter, Nebr., hailstones and apples (the latter having been knocked off the trees) lay on the ground together and were so nearly of the same size that in a photograph it is difficult to distinguish between them. At one place hail was visible on the ground two days after the storm. Hailstones were blown from one side of houses through to the other side. Barnyard poultry suffered heavy losses. Young pigs and calves were fatally injured. Horses and cattle in pasture were so bruised that they were covered with blood. Fruit trees and crops were seriously damaged.

R. DEC. WARD

EUROPE

Food Production in the British Isles. Truly remarkable among war-time achievements is the agricultural revival in Britain. The zenith of British agriculture as regards gross production was reached some forty or more years ago. In 1872 the arable land of England and Wales amounted to 13,839,000 acres. This figure has never been exceeded. A steady decline had reduced it by 26 per cent at the outbreak of the war (see statistics and graphic representations in A. D. Hall's "Agriculture After the War," Dutton, New York, 1916). Since 1916 the process has been reversed, and it is estimated that a gain of 2,500,000 acres of tilled land has been made in England. Similar estimates place the increases in Scotland at 300,000 acres and Ireland at 1,500,000 acres, making a total for the British Isles certainly not less than 4,000,000 acres. In April of this year an official census for England and Wales returned a great increase in the acreage of all breadstuff crops (according to a report of the Director-General of Food Production, quoted in the *London Times, Weekly Edition*, May 31, 1918). Over the figures for 1916 wheat shows a gain of 39 per cent; the acreage of 2,665,000 is the highest on record since 1882. Oats gained by 35 per cent, the acreage being a record, as is the case with potatoes, where the gain is 50 per cent. If the yield be up to the average—and so far conditions have been favorable—it will be possible to supply the United Kingdom with homegrown breadstuffs for four-fifths of the year. In the year 1916-17 the home production was but one-fifth of the consumption. This calculation is made, of course, on the present scale of consumption and degree of milling and on the use of wheat substitutes for bread.

This great achievement has been carried out under exceptional difficulties of labor shortage. In part it has been rendered possible by the increased use of machinery, in particular of the American motor tractor. The American Consul-General in London estimates that the number of these tractors imported since the beginning of the food campaign of November, 1915, is over 8,000 (*Official Bulletin*, Washington, July 3, 1918, p. 7, quoting from *Commerce Repts.*).

The Mineral Resources of Alsace-Lorraine and Their Significance. For the French people righting of a great wrong will undoubtedly be the sentiment most deeply involved in the restoration of Alsace-Lorraine. But it is not all. Besides the moral consequences there are the economic. As M. De Launay points out, part of the interest of the provinces lies "in their soil and still more in their sub-soil. It lies in the iron ore of Lorraine, the coal of the Saar, the potash and petroleum; in the cotton and woolen industries, in the agricultural products" (L. De Launay: La valeur économique de l'Alsace-Lorraine, *La Nature,* May 4, 1918; see also his "France-Allemagne: Problèmes miniers—Munitions—Blocus—Après-Guerre," Colin, Paris, 1917). Dominating the situation is the iron ore of Lorraine (see the map of the mineral resources of Alsace-Lorraine in this number, Pl. VI). Its momentous interest is of recent date. In 1870 neither the ultimate value nor the extent of the deposits was suspected by either French or German metallurgists. Invention of the "basic" process of steel making by the English metallurgist Thomas in 1878 put a new value on the phosphoric ores (see note "The Situation of the Steel Industry in Great Britain," *Geogr. Rev.,* January, 1918, p. 74). Discovery of the extension of the deposits under the Briey plateau accused Teutonic greed of a lack of prescience. On the present value of the field the figures are eloquent. In 1913 German Lorraine produced 21,000,000 tons of ore out of a total of 28,600,000 for all Germany; more than 6,500,000 tons were extracted in Luxemburg; and in French Lorraine 19,500,000 out of a total for Europe of 21,700,000. Altogether the entire basin produced 47,000,000 tons. Leaving aside Luxemburg, the restoration of Alsace-Lorraine will give France mastery of the iron supplies of Europe with a production of 43,000,000 tons. German home production will be reduced to 7,500,000 tons. Here is a potent factor making for peace.

Ore-production alone, however, does not express the highest economic development: export of machinery is more profitable than export of the raw material. Where the value of the Lorraine ore is estimated at three billions of francs, value of the elaborated product is placed at three hundred billions. But if after the war France has the iron, Germany will still have the coal, that is in our day, as De Launay says, the very life-blood of a nation. The pre-war coal requirements of France amounted to 60,000,000 tons, one-third of which was imported. If to the pre-war industries should be added the metallurgical and textile industries of Alsace-Lorraine the requirements would of course be greatly increased. In part the situation might be ameliorated by return to France of the Saar coalfield, a territory lost in 1815 (cf. Pl. VI). The annual production of this coalfield amounts to 17,000,000 tons of a product said to be inferior for reduction to coke and thus for siderurgical purposes. This view, however, has been questioned. Fernand Engerand, describing the basin as "an unknown terrain which may have in reserve happy surprises," says that rather "is it politically that the coal of the Saar is not suitable for siderurgy" (La politique métallurgique de l'état allemand, *Le Correspondant,* Vol. 264, 1916, pp. 769-797 and 961-987). It is well known that Imperial policy has concentrated metallurgical industries on the Westphalian coalfield to the detriment of the centers nearer the western frontier.

Next in value of the mineral resources comes the potash of Mülhausen, one of the very few known deposits in the world (see the note "A New Abyssinian Potash Deposit," *Geogr. Rev.,* Vol. 5, 1918, p. 149). Its importance may be gaged from the extent of the deposit "in sight," two billion tons. The amount extracted since the first shafts were sunk in 1911 hardly gives an idea of the possible output, for the German State, the principal proprietor of the Stassfurt mines, till then holding the world monopoly, has not favored the competition of Mülhausen, with its considerable French interests.

Less valuable are the petroleum resources of the Pechelbronn basin north of Strasburg; nevertheless their annual output of 50,000 tons will be welcome in a country quite deficient in the product. The case of the salt deposits is entirely different. Already French production of salt exceeds consumption and the exterior market is limited; today extraction is limited by syndicate. Addition of the salt mines of German Lorraine would necessitate some delicate adjustments in regard to the industry.

HUMAN GEOGRAPHY

Meteorology and Aviation. Although far removed from the seat of war, Australia has been doing effective and practical work in connection with the application of meteorology to aviation. In less than a month after the declaration of war, instruction in meteorology was begun at the Commonwealth Flying School, at Point Cook, the Honorary Lecturer in Meteorology being Dr. Griffith Taylor. Brief accounts of some

of the flights made in 1915-17 are given by Dr. Taylor and by some of his students in the *Australian Monthly Weather Report and Meteorological Abstract* for July, 1913 (published in 1917). The practical value of the meteorological observations which may be made by an aviator is clearly shown in these essays. During a flight made by Dr. Taylor on March 13, 1917, it was "bumpy" up to 2,500 feet. At 4,400 feet a belt of "low density" air was encountered, perhaps due to the dampness over a number of small lakes and swamps. Here it was impossible for the machine to climb until it was over the ocean, where no difficulty was experienced. Climbing was distinctly better over the sea, but the difference was not apparent above 5,000 or 6,000 feet. "Bumps" are characteristic of the sunny hours, and are due to differences of surface cover and to topography. The alternation of ploughed fields, of grassland, of swamps, even of hard roads, causes very conflicting vertical currents. As soon as the propeller is adjusted to the conditions over one patch of ground, a different surface produces different conditions. Thus constant readjustments are necessary, and "bumps" are unavoidable. These irregularities decrease as the altitude increases. They may extend to a few hundred feet only, or they may reach thousands of feet. On one occasion the obscuration of the sun by a cloud on a warm day was found to produce descending currents over surfaces which had previously been the seat of rising currents. "Bumpiness" was found to be greatest when there are scattered clouds, these producing differences of sunshine and shade, and hence of warming or cooling. There was less disturbance when the sky was perfectly clear or overcast. The good flying conditions associated with inversions of temperature are emphasized. The lower air is then cool, dense, and stable. On one occasion, when there was an absolute calm at the surface until nearly noon, a distinct wave layer was encountered at 800 to 1,000 feet.

Buildings, groves of trees, or similar obstacles produce "bumps," the extent of these irregularities being mainly influenced by the wind velocity. "As obstacles of this character are approached with a following wind, the machine will lift, and drop with equal suddenness on the other side. If approached head to wind, the converse will take place—the machine will probably drop just before reaching the obstacle and rise as it leaves it." The wind, on reaching the obstruction, shoots upwards. The effect extends considerably above the height of the obstacle.

The conditions described in these essays are the common experience of aviators everywhere (consult the papers cited in the note on "Meteorology and Flying" in the April *Review*, Vol. 5, 1918, p. 332). The work in Australia emphasizes clearly the fact that the place and the time to teach aviators the essential meteorological facts is on the flying field and not in the "Ground School." Anyone who has had experience in teaching American aviators the very meager amount of meteorology which the "Ground School" provides for will doubtless agree with this statement.

R. DEC. WARD

GEOGRAPHICAL NEWS

PERSONAL

CAPTAIN ROBERT A. BARTLETT has been awarded the Back Grant of the Royal Geographical Society in recognition of his distinguished leadership after the loss of the *Karluk*, the ship of the Stefansson expedition. The award took place at the Anniversary General Meeting of the Society in London on May 27. The High Commissioner for Canada received the grant on Captain Bartlett's behalf. The grant consists of the interest on a legacy bequeathed by Admiral Sir George Back, the Arctic explorer, on his death in 1878.

DR. G. F. MCEWEN of the Scripps Institution for Biological Research read a paper on "A Tentative Plan of Observation for Gaining Detailed Knowledge of the Circulation of the North Pacific" at the semi-centenary of the University of California, March 18-23.

PROFESSOR LAWRENCE MARTIN has been awarded the Prix Conrad Malte-Brun, a gold medal, by the Paris Geographical Society for his studies on the glaciers of Alaska. The award was made at a meeting of the society on May 17; the medal will not be struck until after the war.

DR. T. GRIFFITH TAYLOR of the Commonwealth Meteorological Bureau of Australia has recently been awarded the David Syme Research Prize for 1918 for a thesis based on the correlation of Australian physiography, meteorology, and climatology, with special reference to the control of its settlement and industrial development. This thesis is along the same general lines as his other recent papers, noticed in the *Review* (Jan., 1918, pp. 77 and 86, Feb., 1918, p. 152).

MR. J. B. TYRRELL, for a long time associated with the Geological Survey of Canada, was awarded the Murchison Medal of the Geological Society of London on February 15 in recognition of his many contributions to our knowledge of northern Canada.

MR. WILLIAM B. VAN VALIN of the University of Pennsylvania Museum has been in Alaska for some time as leader of its John Wanamaker Expedition, studying the Eskimos in the Point Barrow region. Phonograph records of Eskimo songs and stories have been made, as well as motion pictures of the native dances and occupations.

OBITUARY

DR. JOSEPH DENIKER, the distinguished French anthropologist, died on March 18 at the age of 66. Dr. Deniker is best known for his work relating to the classification of human races, more especially the races of Europe. His chief work is "The Races of Man" (Contemporary Scientific Series), London, 1900.

DR. G. K. GILBERT, the geologist, one of the senior members of the staff of the U. S. Geological Survey, died at Jackson, Mich., on May 1 in his seventy-fourth year. An appreciation of Dr. Gilbert's work will appear in a later number of the *Review*.